

What is claimed is:

1. An apparatus for measuring sizes of articles comprising:

5 a light projecting device for projecting light toward an article from one side of the article;

a photo-sensor device arranged on the other side of the article and including a plurality of photo-detectors arranged in array in a first direction such that light projected from said light projecting device and impinging
10 upon the photo-sensor device without being interrupted by the article is received by one or more photo-detectors;

a driving device for reciprocally moving said article and said light projecting device and photo-sensor device relative to each other in a second direction
15 perpendicular to said first direction;

a shifting device for shifting said photo-sensor device in said first direction into at least first and second positions which are mutually separated by a distance smaller than a pitch at which said photo-
20 detectors are arranged in array;

a control device for controlling said driving device and shifting device such that when said article and light projecting device and photo-sensor device are moved by said driving device in a forward direction, said photo-
25 sensor device is in said first position and when said article and light projecting device and photo-sensor device are moved by said driving device in a backward direction, said photo-sensor device is in said second position; and

a signal processing device for processing output signals generated from said photo-detectors under a control of a control signal supplied from said control device to measure size of the article with a resolution
5 higher than the pitch at which said photo-detectors are arranged in array.

2. The apparatus according to claim 1, wherein the photo-detectors in the photo-sensor device are arranged into a single array with the pitch L and the
10 photo-sensor device is shifted in the second direction over a distance of $L/2$.

3. The apparatus according to claim 1, wherein the photo-detectors in the photo-sensor device are arranged into n (n is integer equal to or larger than 2) rows with
15 the pitch L and the n rows of photo-detectors are relatively shifted in the second direction by a distance L/n , and the photo-sensor device is shifted in the second direction over a distance of $L/2n$.

4. The apparatus according to claim 2 or 3,
20 wherein the article is placed on a transparent plate and the light projecting device and the photo-sensor device are arranged on respective sides of the transparent plate.

5. The apparatus according to claim 4, wherein said transparent plate is arranged stationary and said
25 light projecting device and photo-sensor device are arranged movably in the first direction.

6. The apparatus according to claim 5, wherein said light projecting device is provided on a lower horizontal portion of a frame and said photo-sensor

device is provided on an upper horizontal portion of the frame, and said frame is arranged movably in the first direction.

7. The apparatus according to claim 1, wherein
5 said light projecting device includes plural light emitting elements arranged in the second direction to project a substantially parallel light flux.

8. The apparatus according to claim 7, wherein
the number of said light emitting elements is identical
10 with that of the photo-detectors, and the light emitting elements are arranged in array to be corresponding to respective photo-detectors one by one.

9. The apparatus according to claim 8, wherein
the array of the light emitting elements is shifted in
15 the second direction together with the photo-sensor device.

20

25